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Serial No. : 10/070,794 Examiner : Unknown
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Title : VARIANTS OF THE GAMMA CHAIN OF AMPK, DNA SEQUENCES
ENCODING THE SAME, AND USES THEREOF

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I, Judith A. Wasilkus, declare that I personally prepared the paper and the computer-readable copy of the Sequence Listing filed herewith for the above-identified application and that the content of both is the same.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of The United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: October 4, 2002

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October 4, 2002
Date of Deposit

SEQUENCE LISTING

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 LE ROY, Pascale
 CHARDON, Patrick

<120> VARIANTS OF THE GAMMA CHAIN OF AMPK, DNA SEQUENCES ENCODING
 THE SAME, AND USES THEREOF

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| Val Ser Gly Ala Val Leu His Ile Leu Thr His Lys Arg Leu Leu Lys | |
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| | 50 | | | | | 55 | | | | | 60 | | | | |
| Glu | Ala | Thr | Phe | Pro | Lys | Ala | Thr | Pro | Leu | Ala | Gln | Ala | Ala | Pro | Leu |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ala | Glu | Val | Asp | Asn | Pro | Pro | Thr | Glu | Arg | Asp | Ile | Leu | Pro | Ser | Asp |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Cys | Ala | Ala | Ser | Ala | Ser | Asp | Ser | Asn | Thr | Asp | His | Leu | Asp | Leu | Gly |
| | | | 100 | | | | | 105 | | | | 110 | | | |
| Ile | Glu | Phe | Ser | Ala | Ser | Ala | Ala | Ser | Gly | Asp | Glu | Leu | Gly | Leu | Val |
| | | 115 | | | | | 120 | | | | 125 | | | | |
| Glu | Glu | Lys | Pro | Ala | Pro | Cys | Pro | Ser | Pro | Glu | Val | Leu | Leu | Pro | Arg |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Gly | Trp | Asp | Asp | Glu | Leu | Gln | Lys | Pro | Gly | Ala | Gln | Val | Tyr | Met |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |

His Phe Met Gln Glu His Thr Cys Tyr Asp Ala Met Ala Thr Ser Ser
 165 170 175
 Lys Leu Val Ile Phe Asp Thr Met Leu Glu Ile Lys Lys Ala Phe Phe
 180 185 190
 Ala Leu Val Ala Asn Gly Val Arg Ala Ala Pro Leu Trp Asp Ser Lys
 195 200 205
 Lys Gln Ser Phe Val Gly Met Leu Thr Ile Thr Asp Phe Ile Leu Val
 210 215 220
 Leu His Arg Tyr Tyr Arg Ser Pro Leu Val Gln Ile Tyr Glu Ile Glu
 225 230 235 240
 Glu His Lys Ile Glu Thr Trp Arg Glu Ile Tyr Leu Gln Gly Cys Phe
 245 250 255
 Lys Pro Leu Val Ser Ile Ser Pro Asn Asp Ser Leu Phe Glu Ala Val
 260 265 270
 Tyr Ala Leu Ile Lys Asn Arg Ile His Arg Leu Pro Val Leu Asp Pro
 275 280 285
 Val Ser Gly Ala Val Leu His Ile Leu Thr His Lys Arg Leu Leu Lys
 290 295 300
 Phe Leu His Ile Phe Gly Thr Leu Leu Pro Arg Pro Ser Phe Leu Tyr
 305 310 315 320
 Arg Thr Ile Gln Asp Leu Gly Ile Gly Thr Phe Arg Asp Leu Ala Val
 325 330 335
 Val Leu Glu Thr Ala Pro Ile Leu Thr Ala Leu Asp Ile Phe Val Asp
 340 345 350
 Arg Arg Val Ser Ala Leu Pro Val Val Asn Glu Thr Gly Gln Val Val
 355 360 365
 Gly Leu Tyr Ser Arg Phe Asp Val Ile His Leu Ala Ala Gln Gln Thr
 370 375 380
 Tyr Asn His Leu Asp Met Asn Val Gly Glu Ala Leu Arg Gln Arg Thr
 385 390 395 400
 Leu Cys Leu Glu Gly Val Leu Ser Cys Gln Pro His Glu Thr Leu Gly
 405 410 415
 Glu Val Ile Asp Arg Ile Val Arg Glu Gln Val His Arg Leu Val Leu
 420 425 430
 Val Asp Glu Thr Gln His Leu Leu Gly Val Val Ser Leu Ser Asp Ile
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 Leu Gln Ala Leu Val Leu Ser Pro Ala Gly Ile Asp Ala Leu Gly Ala
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 <212> ADN
 <213> Homo sapiens

<220>
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 gtg acc agc agc tca gaa aga atc cgt ggg aaa cgg agg gcc aaa gcc 96
 Val Thr Ser Ser Ser Glu Arg Ile Arg Gly Lys Arg Arg Ala Lys Ala
 20 25 30

| | |
|---|-----|
| ttg aga tgg aca agg cag aag tcg gtg gag gaa ggg gag cca cca ggt | 144 |
| Leu Arg Trp Thr Arg Gln Lys Ser Val Glu Glu Gly Glu Pro Pro Gly | |
| 35 40 45 | |
| cag ggg gaa ggt ccc cgg tcc agg cca act gct gag tcc acc ggg ctg | 192 |
| Gln Gly Glu Gly Pro Arg Ser Arg Pro Thr Ala Glu Ser Thr Gly Leu | |
| 50 55 60 | |
| gag gcc aca ttc ccc aag acc aca ccc ttg gct caa gct gat cct gcc | 240 |
| Glu Ala Thr Phe Pro Lys Thr Thr Pro Leu Ala Gln Ala Asp Pro Ala | |
| 65 70 75 80 | |
| ggg gtg ggc act cca cca aca ggg tgg gac tgc ctc ccc tct gac tgt | 288 |
| Gly Val Gly Thr Pro Pro Thr Gly Trp Asp Cys Leu Pro Ser Asp Cys | |
| 85 90 95 | |
| aca gcc tca gct gca ggc tcc agc aca gat gat gtg gag ctg gcc acg | 336 |
| Thr Ala Ser Ala Ala Gly Ser Ser Thr Asp Asp Val Glu Leu Ala Thr | |
| 100 105 110 | |
| gag ttc cca gcc aca gag gcc tgg gag tgt gag cta gaa ggc ctg ctg | 384 |
| Glu Phe Pro Ala Thr Glu Ala Trp Glu Cys Glu Leu Glu Gly Leu Leu | |
| 115 120 125 | |
| gaa gag agg cct gcc ctg tgc ctg tcc ccg cag gcc cca ttt ccc aag | 432 |
| Glu Glu Arg Pro Ala Leu Cys Leu Ser Pro Gln Ala Pro Phe Pro Lys | |
| 130 135 140 | |
| ctg ggc tgg gat gac gaa ctg cgg aaa ccc ggc gcc cag atc tac atg | 480 |
| Leu Gly Trp Asp Asp Glu Leu Arg Lys Pro Gly Ala Gln Ile Tyr Met | |
| 145 150 155 160 | |
| cgc ttc atg cag gag cac acc tgc tac gat gcc atg gca act agc tcc | 528 |
| Arg Phe Met Gln Glu His Thr Cys Tyr Asp Ala Met Ala Thr Ser Ser | |
| 165 170 175 | |
| aag cta gtc atc ttc gac acc atg ctg gag atc aag aag gcc ttc ttt | 576 |
| Lys Leu Val Ile Phe Asp Thr Met Leu Glu Ile Lys Lys Ala Phe Phe | |
| 180 185 190 | |
| gct ctg gtg gcc aac ggt gtg cgg gca gcc cct cta tgg gac agc aag | 624 |
| Ala Leu Val Ala Asn Gly Val Arg Ala Ala Pro Leu Trp Asp Ser Lys | |
| 195 200 205 | |
| aag cag agc ttt gtg ggg atg ctg acc atc act gac ttc atc ctg gtg | 672 |
| Lys Gln Ser Phe Val Gly Met Leu Thr Ile Thr Asp Phe Ile Leu Val | |
| 210 215 220 | |
| ctg cat cgc tac tac agg tcc ccc ctg gtc cag atc tat gag att gaa | 720 |
| Leu His Arg Tyr Tyr Arg Ser Pro Leu Val Gln Ile Tyr Glu Ile Glu | |
| 225 230 235 240 | |
| caa cat aag att gag acc tgg agg gag atc tac ctg caa ggc tgc ttc | 768 |
| Gln His Lys Ile Glu Thr Trp Arg Glu Ile Tyr Leu Gln Gly Cys Phe | |
| 245 250 255 | |

| | |
|---|------|
| aag cct ctg gtc tcc atc tct cct aat gat agc ctg ttt gaa gct gtc | 816 |
| Lys Pro Leu Val Ser Ile Ser Pro Asn Asp Ser Leu Phe Glu Ala Val | |
| 260 265 270 | |
| tac acc ctc atc aag aac cgg atc cat cgc ctg cct gtt ctt gac ccg | 864 |
| Tyr Thr Leu Ile Lys Asn Arg Ile His Arg Leu Pro Val Leu Asp Pro | |
| 275 280 285 | |
| gtg tca ggc aac gta ctc cac atc ctc aca cac aaa cgc ctg ctc aag | 912 |
| Val Ser Gly Asn Val Leu His Ile Leu Thr His Lys Arg Leu Leu Lys | |
| 290 295 300 | |
| ttc ctg cac atc ttt ggt tcc ctg ctg ccc cgg ccc tcc ttc ctc tac | 960 |
| Phe Leu His Ile Phe Gly Ser Leu Leu Pro Arg Pro Ser Phe Leu Tyr | |
| 305 310 315 320 | |
| cgc act atc caa gat ttg ggc atc ggc aca ttc cga gac ttg gct gtg | 1008 |
| Arg Thr Ile Gln Asp Leu Gly Ile Gly Thr Phe Arg Asp Leu Ala Val | |
| 325 330 335 | |
| gtg ctg gag aca gca ccc atc ctg act gca ctg gac atc ttt gtg gac | 1056 |
| Val Leu Glu Thr Ala Pro Ile Leu Thr Ala Leu Asp Ile Phe Val Asp | |
| 340 345 350 | |
| cgg cgt gtg tct gca ctg cct gtg gtc aac gaa tgt ggt cag gtc gtg | 1104 |
| Arg Arg Val Ser Ala Leu Pro Val Val Asn Glu Cys Gly Gln Val Val | |
| 355 360 365 | |
| ggc ctc tat tcc cgc ttt gat gtg att cac ctg gct gcc cag caa acc | 1152 |
| Gly Leu Tyr Ser Arg Phe Asp Val Ile His Leu Ala Ala Gln Gln Thr | |
| 370 375 380 | |
| tac aac cac ctg gac atg agt gtg gga gaa gcc ctg agg cag agg aca | 1200 |
| Tyr Asn His Leu Asp Met Ser Val Gly Glu Ala Leu Arg Gln Arg Thr | |
| 385 390 395 400 | |
| cta tgt ctg gag gga gtc ctt tcc tgc cag ccc cac gag agc ttg ggg | 1248 |
| Leu Cys Leu Glu Gly Val Leu Ser Cys Gln Pro His Glu Ser Leu Gly | |
| 405 410 415 | |
| gaa gtg atc gac agg att gct cgg gag cag gta cac agg ctg gtg cta | 1296 |
| Glu Val Ile Asp Arg Ile Ala Arg Glu Gln Val His Arg Leu Val Leu | |
| 420 425 430 | |
| gtg gac gag acc cag cat ctc ttg ggc gtg gtc tcc ctc tcc gac atc | 1344 |
| Val Asp Glu Thr Gln His Leu Leu Gly Val Val Ser Leu Ser Asp Ile | |
| 435 440 445 | |
| ctt cag gca ctg gtg ctc agc cct gct ggc atc gat gcc ctc ggg gcc | 1392 |
| Leu Gln Ala Leu Val Leu Ser Pro Ala Gly Ile Asp Ala Leu Gly Ala | |
| 450 455 460 | |
| tga gaagatctga gtcctcaatc ccaagccaac tgcacactgg aagccaatga | 1445 |

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 gagtcctccc tccattcttg tccagaaaac tccttagctc tcgcagtgc ccatgttctt 1985
 agtctccagg gatggatggc cttgtatatg gaccctgag aatgagcaat tgagaaaaca 2045
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 atttgacctg 2115

<210> 30
 <211> 464
 <212> PRT
 <213> Homo sapiens

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 20 25 30
 Leu Arg Trp Thr Arg Gln Lys Ser Val Glu Glu Gly Glu Pro Pro Gly
 35 40 45
 Gln Gly Glu Gly Pro Arg Ser Arg Pro Thr Ala Glu Ser Thr Gly Leu
 50 55 60
 Glu Ala Thr Phe Pro Lys Thr Thr Pro Leu Ala Gln Ala Asp Pro Ala
 65 70 75 80
 Gly Val Gly Thr Pro Pro Thr Gly Trp Asp Cys Leu Pro Ser Asp Cys
 85 90 95
 Thr Ala Ser Ala Ala Gly Ser Ser Thr Asp Asp Val Glu Leu Ala Thr
 100 105 110
 Glu Phe Pro Ala Thr Glu Ala Trp Glu Cys Glu Leu Glu Gly Leu Leu
 115 120 125
 Glu Glu Arg Pro Ala Leu Cys Leu Ser Pro Gln Ala Pro Phe Pro Lys
 130 135 140
 Leu Gly Trp Asp Asp Glu Leu Arg Lys Pro Gly Ala Gln Ile Tyr Met
 145 150 155 160
 Arg Phe Met Gln Glu His Thr Cys Tyr Asp Ala Met Ala Thr Ser Ser
 165 170 175
 Lys Leu Val Ile Phe Asp Thr Met Leu Glu Ile Lys Lys Ala Phe Phe
 180 185 190

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Leu | Val | Ala | Asn | Gly | Val | Arg | Ala | Ala | Pro | Leu | Trp | Asp | Ser | Lys |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Lys | Gln | Ser | Phe | Val | Gly | Met | Leu | Thr | Ile | Thr | Asp | Phe | Ile | Leu | Val |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Leu | His | Arg | Tyr | Tyr | Arg | Ser | Pro | Leu | Val | Gln | Ile | Tyr | Glu | Ile | Glu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Gln | His | Lys | Ile | Glu | Thr | Trp | Arg | Glu | Ile | Tyr | Leu | Gln | Gly | Cys | Phe |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Lys | Pro | Leu | Val | Ser | Ile | Ser | Pro | Asn | Asp | Ser | Leu | Phe | Glu | Ala | Val |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Tyr | Thr | Leu | Ile | Lys | Asn | Arg | Ile | His | Arg | Leu | Pro | Val | Leu | Asp | Pro |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Val | Ser | Gly | Asn | Val | Leu | His | Ile | Leu | Thr | His | Lys | Arg | Leu | Leu | Lys |
| | 290 | | | | 295 | | | | | | 300 | | | | |
| Phe | Leu | His | Ile | Phe | Gly | Ser | Leu | Leu | Pro | Arg | Pro | Ser | Phe | Leu | Tyr |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Arg | Thr | Ile | Gln | Asp | Leu | Gly | Ile | Gly | Thr | Phe | Arg | Asp | Leu | Ala | Val |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Val | Leu | Glu | Thr | Ala | Pro | Ile | Leu | Thr | Ala | Leu | Asp | Ile | Phe | Val | Asp |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Arg | Arg | Val | Ser | Ala | Leu | Pro | Val | Val | Asn | Glu | Cys | Gly | Gln | Val | Val |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Gly | Leu | Tyr | Ser | Arg | Phe | Asp | Val | Ile | His | Leu | Ala | Ala | Gln | Gln | Thr |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Tyr | Asn | His | Leu | Asp | Met | Ser | Val | Gly | Glu | Ala | Leu | Arg | Gln | Arg | Thr |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Leu | Cys | Leu | Glu | Gly | Val | Leu | Ser | Cys | Gln | Pro | His | Glu | Ser | Leu | Gly |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Glu | Val | Ile | Asp | Arg | Ile | Ala | Arg | Glu | Gln | Val | His | Arg | Leu | Val | Leu |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Val | Asp | Glu | Thr | Gln | His | Leu | Leu | Gly | Val | Val | Ser | Leu | Ser | Asp | Ile |
| | 435 | | | | | | 440 | | | | | 445 | | | |
| Leu | Gln | Ala | Leu | Val | Leu | Ser | Pro | Ala | Gly | Ile | Asp | Ala | Leu | Gly | Ala |
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<210> 31
 <211> 2022
 <212> ADN
 <213> Sus scrofa

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 agcagcctcg ggggacctaa gcatcaagag atgagcttcc tagagcaagg agagagccgt 180
 tcatggccat cccgagctgt aaccaccagc tcagaaagaa gccatgggga ccaggggaac 240
 aaggcctcta gatggacaag gcaggaggat gtagaggaag gggggcctcc gggcccgagg 300
 gaagggtccc agtccaggcc agttgctgag tccaccgggc aggaggccac attccccaaag 360
 gccacaccct tggcccaagc cgctcccttg gccgaggtgg acaaccccc aacagagcgg 420
 gacatcctcc cctctgactg tgcagcctca gcctccgact ccaacacaga ccatctggat 480
 ctgggcatag agttctcagc ctcgggcgcg tcgggggatg agcttgggct ggtggaagag 540
 aagccagccc cgtgcccata cccagagggt ctgttaccca ggctgggctg ggatgatgag 600
 ctgcagaagc cggggggccc ggtctacatg cacttcatgc aggagcacac ctgctacgat 660
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gggagttaga gctgcctctc ctcagttcag ttccccctg ctgagaatgt ccctggaagg 1980
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<210> 32
<211> 514
<212> PRT
<213> Sus scrofa

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Arg Gly Gly Trp Glu Leu Glu Gln Leu Arg Pro Glu Gly Arg Gly Pro
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Thr Thr Ala Asp Thr Pro Ser Trp Ser Ser Leu Gly Gly Pro Lys His
    35              40              45

Gln Glu Met Ser Phe Leu Glu Gln Gly Glu Ser Arg Ser Trp Pro Ser
    50              55              60

Arg Ala Val Thr Thr Ser Ser Glu Arg Ser His Gly Asp Gln Gly Asn
    65              70              75              80

Lys Ala Ser Arg Trp Thr Arg Gln Glu Asp Val Glu Glu Gly Gly Pro
    85              90              95

Pro Gly Pro Arg Glu Gly Pro Gln Ser Arg Pro Val Ala Glu Ser Thr
   100              105              110

Gly Gln Glu Ala Thr Phe Pro Lys Ala Thr Pro Leu Ala Gln Ala Ala
   115              120              125

Pro Leu Ala Glu Val Asp Asn Pro Pro Thr Glu Arg Asp Ile Leu Pro
   130              135              140

Ser Asp Cys Ala Ala Ser Ala Ser Asp Ser Asn Thr Asp His Leu Asp
   145              150              155              160

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Leu Gly Ile Glu Phe Ser Ala Ser Ala Ala Ser Gly Asp Glu Leu Gly
 165 170 175
 Leu Val Glu Glu Lys Pro Ala Pro Cys Pro Ser Pro Glu Val Leu Leu
 180 185 190
 Pro Arg Leu Gly Trp Asp Asp Glu Leu Gln Lys Pro Gly Ala Gln Val
 195 200 205
 Tyr Met His Phe Met Gln Glu His Thr Cys Tyr Asp Ala Met Ala Thr
 210 215 220
 Ser Ser Lys Leu Val Ile Phe Asp Thr Met Leu Glu Ile Lys Lys Ala
 225 230 235 240
 Phe Phe Ala Leu Val Ala Asn Gly Val Arg Ala Ala Pro Leu Trp Asp
 245 250 255
 Ser Lys Lys Gln Ser Phe Val Gly Met Leu Thr Ile Thr Asp Phe Ile
 260 265 270
 Leu Val Leu His Arg Tyr Tyr Arg Ser Pro Leu Val Gln Ile Tyr Glu
 275 280 285
 Ile Glu Glu His Lys Ile Glu Thr Trp Arg Glu Ile Tyr Leu Gln Gly
 290 295 300
 Cys Phe Lys Pro Leu Val Ser Ile Ser Pro Asn Asp Ser Leu Phe Glu
 305 310 315 320
 Ala Val Tyr Ala Leu Ile Lys Asn Arg Ile His Arg Leu Pro Val Leu
 325 330 335
 Asp Pro Val Ser Gly Ala Val Leu His Ile Leu Thr His Lys Arg Leu
 340 345 350
 Leu Lys Phe Leu His Ile Phe Gly Thr Leu Leu Pro Arg Pro Ser Phe
 355 360 365
 Leu Tyr Arg Thr Ile Gln Asp Leu Gly Ile Gly Thr Phe Arg Asp Leu
 370 375 380
 Ala Val Val Leu Glu Thr Ala Pro Ile Leu Thr Ala Leu Asp Ile Phe
 385 390 395 400
 Val Asp Arg Arg Val Ser Ala Leu Pro Val Val Asn Glu Thr Gly Gln
 405 410 415
 Val Val Gly Leu Tyr Ser Arg Phe Asp Val Ile His Leu Ala Ala Gln
 420 425 430
 Gln Thr Tyr Asn His Leu Asp Met Asn Val Gly Glu Ala Leu Arg Gln
 435 440 445
 Arg Thr Leu Cys Leu Glu Gly Val Leu Ser Cys Gln Pro His Glu Thr
 450 455 460

Leu Gly Glu Val Ile Asp Arg Ile Val Arg Glu Gln Val His Arg Leu
 465 470 475 480

Val Leu Val Asp Glu Thr Gln His Leu Leu Gly Val Val Ser Leu Ser
 485 490 495

Asp Ile Leu Gln Ala Leu Val Leu Ser Pro Ala Gly Ile Asp Ala Leu
 500 505 510

Gly Ala

<210> 33
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 33
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<210> 34
 <211> 20
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<220>
 <223> Primer

<400> 34
 cccacgaagc tctgcttctt 20

<210> 35
 <211> 16
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 35
 tggccaacgg cgtcca 16

<210> 36
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 <212> DNA
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<220>
 <223> Primer

<400> 36
 ggccaacggc gtccg 15

<210> 37

<211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 37
 agcggcacct ttgtgaaaaa aaaaa

25

<210> 38
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 38
 caaactcttc taggcgtgt

19

<210> 39
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 39
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26

<210> 40
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 40
 gggaacgatt caccctcaac

20

<210> 41
 <211> 20
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<220>
 <223> Primer

<400> 41
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20

<210> 42
 <211> 40
 <212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 42

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40